Air Force DoDIIS Infrastructure (AFDI)

An Overview from Conception to Date

AFDI Critical Design Review
19 - 21 September 2000

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Overview

- What is the DII COE?
  - Who mandates it?
  - The DII COE theory
    - Why the theory makes sense
  - Flaws in the theory
    - Implementation flaws
  - DII COE Timeline
    - 497th involvement in the DII COE

Overview (continued)

- What is AFDI?
- Why is the Air Force building it?
- AFDI timeline
- Quick AFDI Status
- The bigger AFDI picture
  - Overall AFDI Architecture
    - A single interoperable infrastructure
    - The AFDI Goal
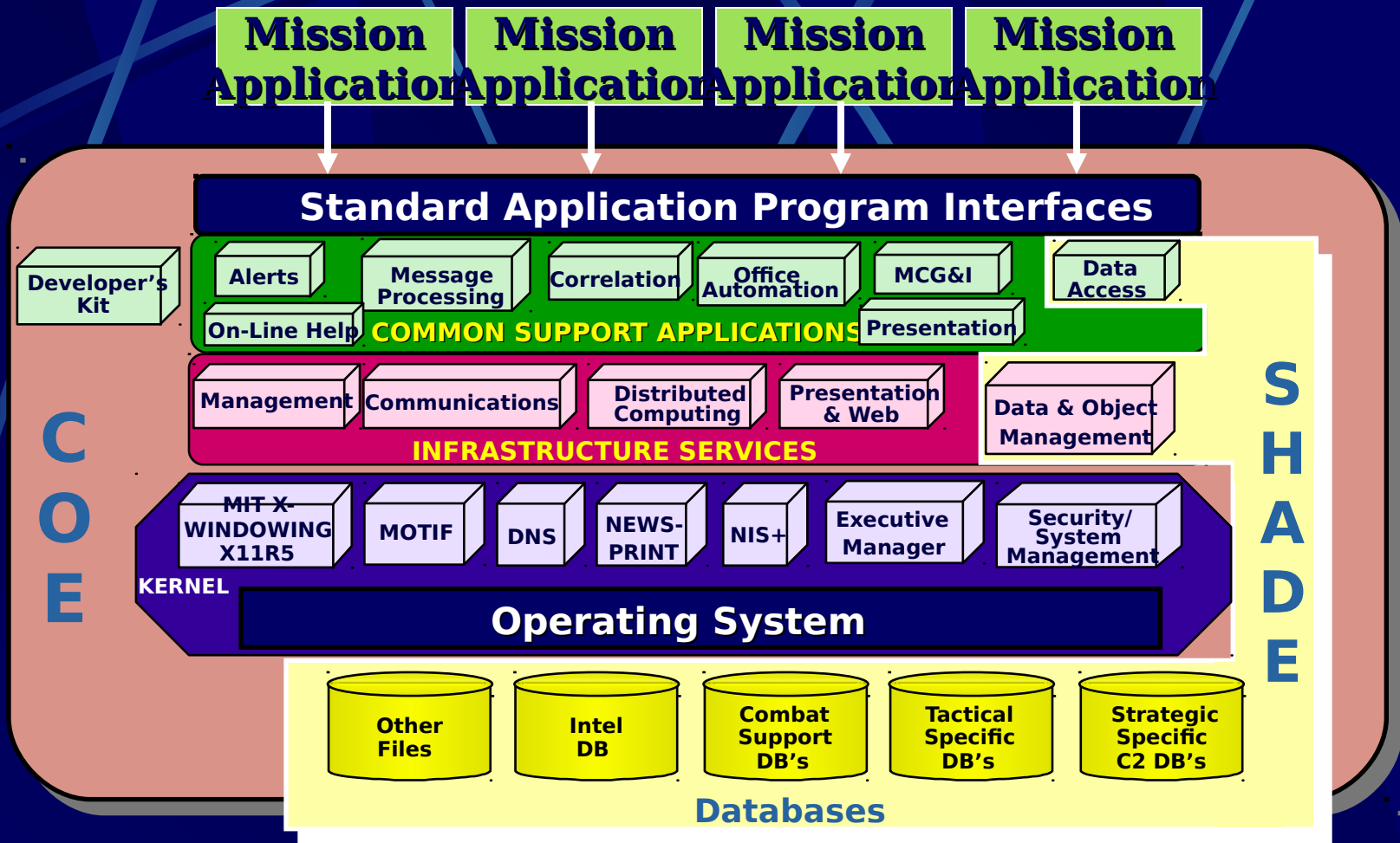   - How far along are we
- Questions?

What is the DII COE?

- DII COE is
  - An architecture
  - An approach
  - A collection of reusable software
  - A software infrastructure
  - A set of guidelines and standards
- DII COE is mission application independent

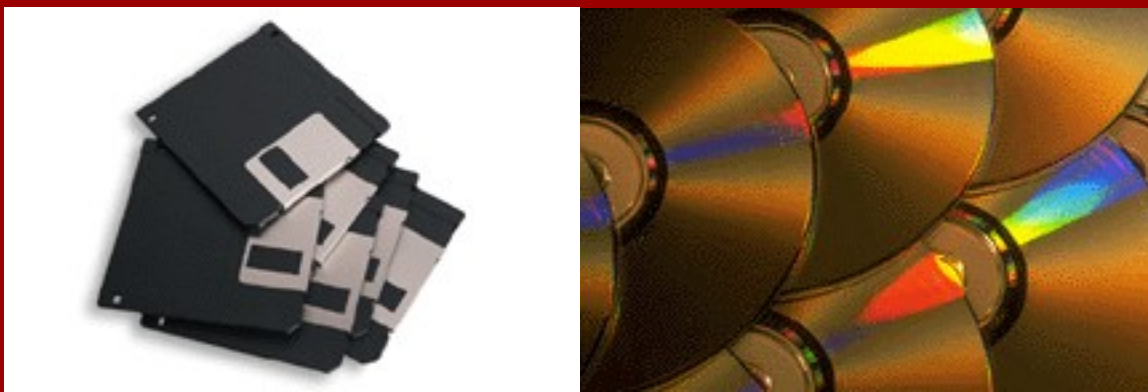**"The DII COE is *not a system*; it is a *foundation* for building a shared system."**

What is the DII COE? (continued)

Mission Application | **Mission Application** | **Mission Application** | **Mission Application**

COE

Standard Application Program Interfaces

Developer's Kit

Alerts | Message Processing | Correlation | Office Automation | MCG&I | Data Access

On-Line Help | **COMMON SUPPORT APPLICATIONS** | Presentation

Management | Communications | Distributed Computing | Presentation & Web | Data & Object Management

INFRASTRUCTURE SERVICES

MIT X-WINDOWING X11R5 | MOTIF | DNS | NEWS-PRINT | NIS+ | Executive Manager | Security/System Management

KERNEL

Operating System

SHADE

Other Files | Intel DB | Combat Support DB's | Tactical Specific DB's | Strategic Specific C2 DB's

Databases

What is the DII COE? (continued)

COE as delivered by DISA

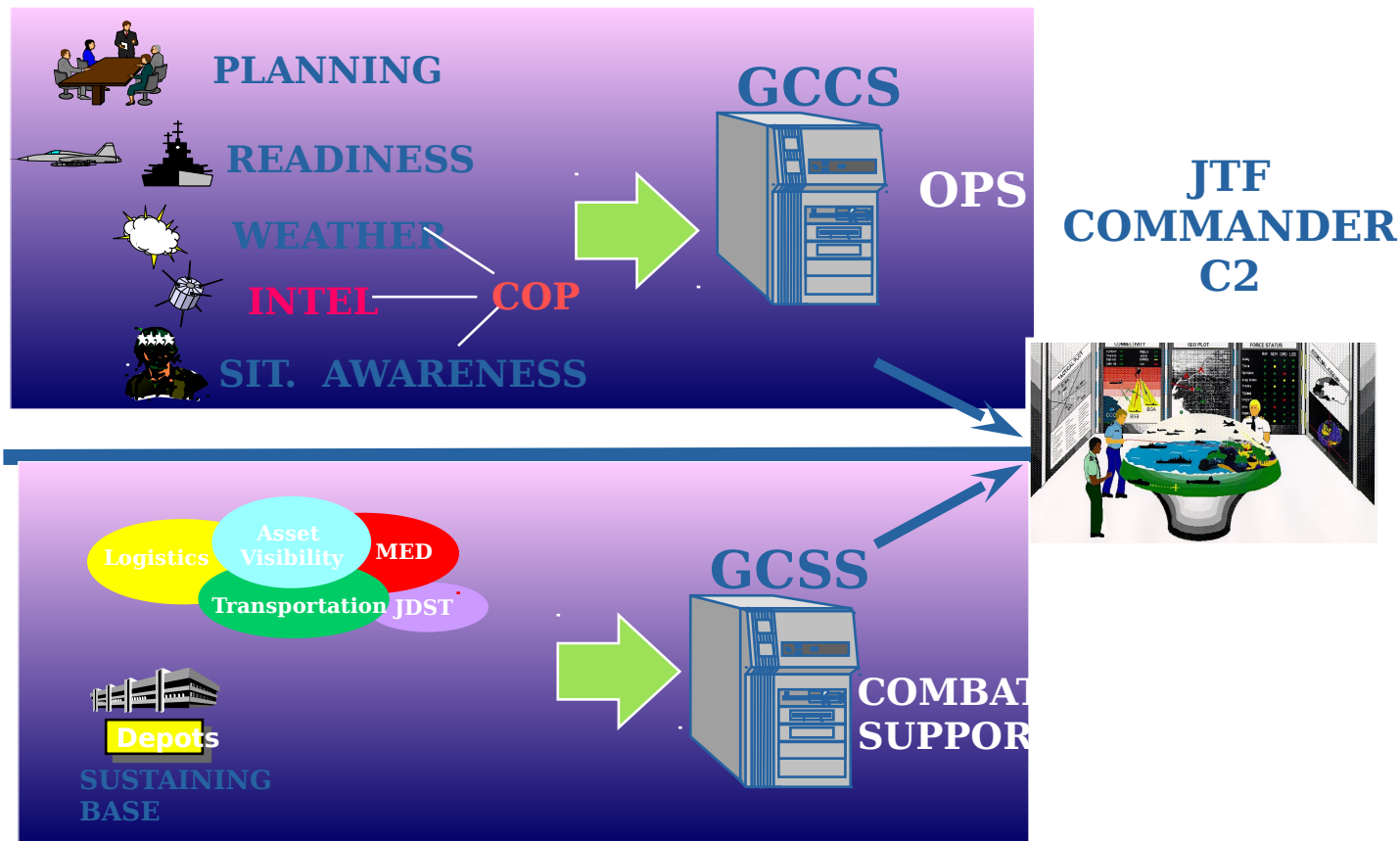When you order a DII COE release, this is what you get

Who mandates it?

- Everybody!!
  - Office of Assistant Secretary of Defense (OASD) memorandum 23 May 1997
  - Defense Planning Guidance 1997 - 2000
  - Joint Technical Architecture (JTA)
  - DoDIIS Management Board (DoDIIS Instructions)
  - DoDIIS Profile of the JTA and DII COE
  - Intelligence Program Decision Memorandum, Instructions (IPDM, I)

The DII COE Theory

PLANNING

READINESS

WEATHER

INTEL ———— COP

SIT. AWARENESS

GCCS

OPS

Logistics | Asset Visibility | MED
Transportation | JDST

Depots

SUSTAINING BASE

GCSS

COMBAT SUPPORT

JTF COMMANDER C2

The DII COE Theory

Fully Integrated Information

Capabilities/Force List

Unit	CRD[1]	EAD[2]
11th TFW	C+ 6	C+ 6
2nd MEF	C+ 7	C+ 7
82nd Airborne Division	C+ 9	C+ 9
Vinson CVBG	C+10	C+ 9
Hq XVIII Corps	C+11	C+ 12
3rd Mechanized Division	C+17	C+ 20
XVIII COSCOM	C+20	C+ 22
XVIII Arty Bde	C+23	C+23
16th ACR (TX ANG)	C+25	C+48
52nd Mech Div (CA ANG)	C+30	C+55
Armored Division	C+40	TBD

C	+ 10
M	+ 5
D	- -

1. CINC's Required Date
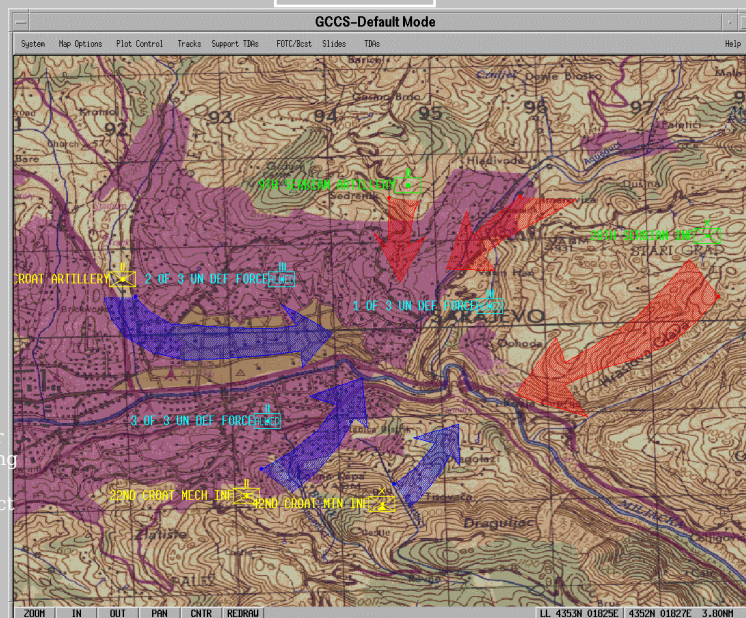2. Estimated Arrival Date

Commander's Intent:
Delay. C - C+10. Use In-Theater Assets; Support RSOI of incoming units and reinforcements.
Defend. C+11 - C+TBD. Conduct mobile defense with 3 Division equivalents, 2 TFW and 2 CVBG.
Attack. TBD. Conduct offensive operations using 6 Division equivalents,2 TFW and 2 CVBG

MISSION: Deter aggression by Badlandia Forces; On order attack to restore status quo ante bellum.

Operational Posture: Defend

Relative Combat Power

	OPFOR	JTF HUSKY		
		US	Allied	Total
Troops	300,000	54,000	47,000	101,000
Tanks	1600	116	232	348
IFV	3200	256	270	526
Artillery	600	168	72	240
Tactical Aircraft	58	177	32	209

GCCS–Default Mode

System   Map Options   Plot Control   Tracks   Support TDAs   FOTC/Bcst   Slides   TDAs   Help

ZOOM   IN   OUT   PAN   CNTR   REDRAW   LL 4353N 01825E 4352N 01827E 3.00NM

Sustainment Logistics

CLASS	Plan DOS	Actual DOS
I - Rations	30	34
II - General Support Items	25	26
III - Fuel & Lubricants	20	18
IV - Engineer	20	10
V - Ammo	30	14
VI - Personal Items	30	22
VII - Major End Items	20	8
VIII - Medical	20	18
IX - Repair Parts	25	18
X - Non-Mil Items	20	16

Personnel

All intheater units at Auth Strength

Any User, Any Box, Anywhere, One Picture!

Why the Theory makes sense

- A Common Operating Environment promotes interoperability
  - Any user, any box, anywhere… One Picture
    - Like applications produce common data formats
- Common applications and Versions means Enterprise licensing throughout DOD
  - Saves on IT Acquisitions
  - Saves on training

Flaws in the Implementation

- The requirements process
  - Diffused across multiple sources
  - Difficult to track requirements from originator to fielding
    - No requirements traceability
  - Air Force requirements subject to much Joint scrutiny
  - Requirements go through too many changes before fielding, may not/do not satisfy original requirement

Flaws in the Implementation (continued)

- Requirements input
  - There are over 19 "Technical" working groups inputting requirements and recommending solutions
    - Impossible to staff all working group meetings to promote Air Force requirements

Flaws in the Implementation (continued)

- *"Build a little, test a little, field a lot"*

Turns into... build a little, test a little, fix a lot!

Flaws in the Implementation (continued)

- DII COE Developers Toolkit and the COEInstaller
  - Command line driven, toolset
  - Required for COE integration
    - The COE only understands Segmented applications
      - Not Segmented apps = integration nightmare
        - Applications not registered with the COE data structure (Common Data Store)
      - Segmented apps in a non-Segmented environment = integration nightmare
        - Non-Segmented environment means no COEInstaller

Flaws in the Implementation (continued)

- Segmentation
  - Turns COTS into GOTS
    - Segmented applications are no longer what you can buy "Off The Shelf"
  - Forces the integrator to utilize the COEInstaller for application installation
    - Makes it extremely difficult to take advantage of native *automated* OS installation technologies
    - Bottom line… Segmented applications are the only thing the COE understands

The DII COE Timeline

COE is not a new or revolutionary idea

- JMCIS → GCCS → DII COE
- DII COE effort began in 1996 as the follow-on to GCCS (GCCS Administration Services +)
  - Name change to DII COE
    - GCCS and DII COE diverge on separate paths

497th Involvement in the DII COE Evolution

- Present at the initial DII COE (GCCS Management Services +) meetings
  - 19 CSE-SS components chosen by the DISA DII COE Chief Engineer as core DII COE components (entire CSE-SS ISSO Palette in Segmented format)
    - 19 Segments paid for by 497th IG and delivered to DISA
    - DoDIIS Engineer financed by 497th IG to support DII COE integration at DISA OSF (1 year)
    - All but 4 Segments later rejected by new DII COE Chief Engineer
      - 4 DoDIIS Segments eliminated completely from the DII COE 4.x series

1996   **1997**

DII COE Evolution (continued)

- *DMB approves 497th recommendation to Re-Segment core CSE-SS components for DoDIIS site use in migration to DII COE*
  - *DISA rejects this proposal and asks for a DII COE security assessment*
- DoDIIS performs a security evaluation of the DII COE V3.2 Kernel
  - Participants include DISA, DIA, Air Force, Army, Navy
    - Recommendation of certifying authorities is that *"DII COE V3.2 should not be fielded in an SCI environment and great caution should be taken in fielding in a non-SCI environment"*

1996   **1997**

DII COE Evolution (continued)

- At DISA request, DoDIIS performs a security assessment of DII COE V3.3
  - COE Kernel and COE Component Segments
  - Participants include DISA, NSA, DIA, Air Force, Navy
    - Recommendation of certifying authorities is that *"DII COE V3.3 should not be fielded in an SCI environment"*

1996   1997   1998

What is AFDI?

- A consistent, stable, secure, Air Force architecture based on the principles of the DII COE
  - Founded on the building blocks of the DII COE
    - Enhanced with Air Force required Security and Infrastructure Components
  - Spiral Development cycle for incremental, phased migration
  - Allows Segmented and Non-Segmented applications to co-exist

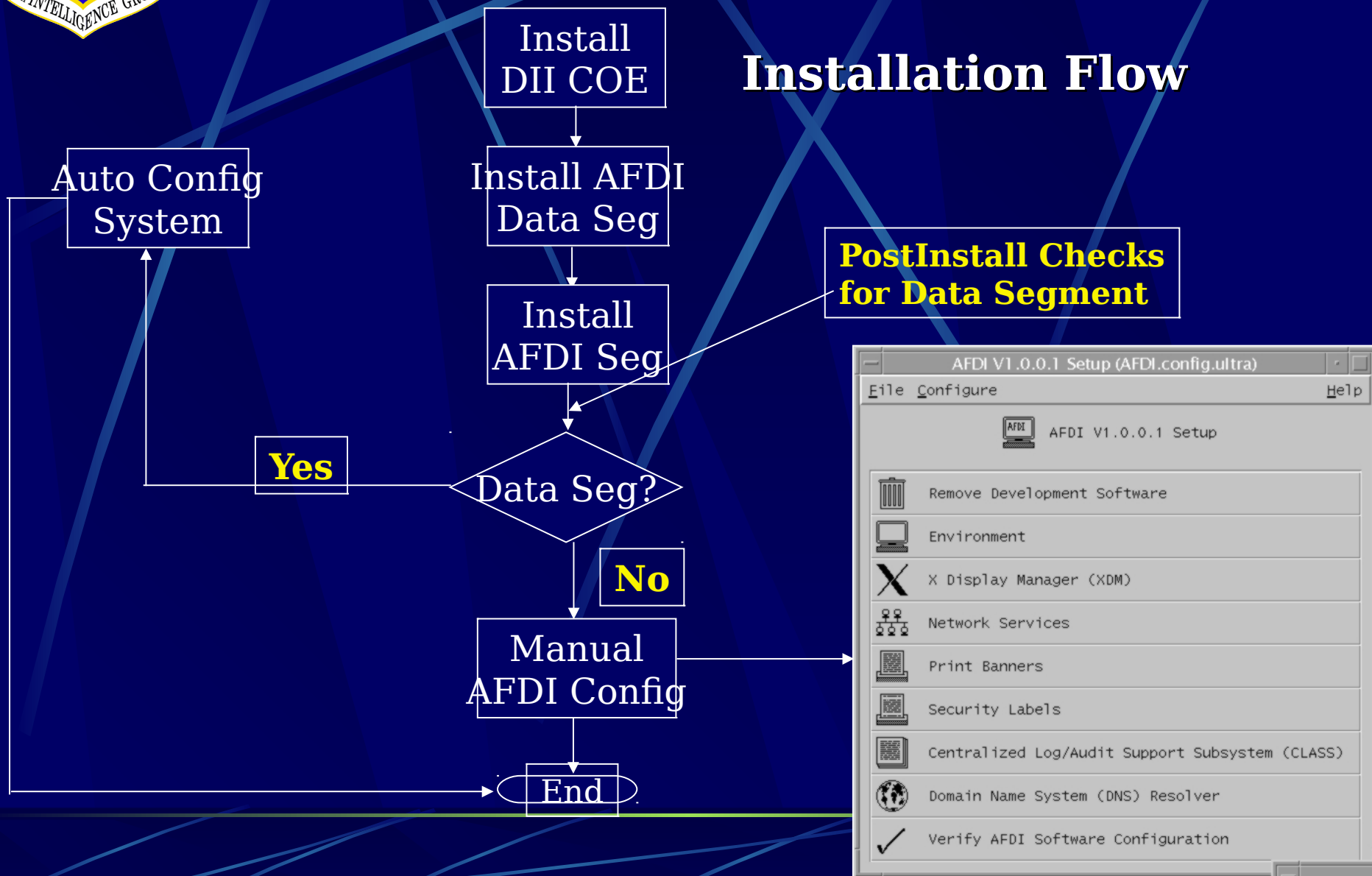1996   1997   1998   1999

What is AFDI? (continued)

- It's TRANSITION!!
  - Transition Utilities take CSE systems to AFDI systems without the need to manually re-enter system data
    - System is analyzed and key data saved in data segment format
    - DII COE is loaded
    - AFDI data segment is loaded
    - AFDI segment is loaded

Automated

What is AFDI? (continued)

Installation Flow

Install DII COE

Install AFDI Data Seg

Install AFDI Seg

PostInstall Checks for Data Segment

Auto Config System

Yes

Data Seg?

No

Manual AFDI Config

End

AFDI V1.0.0.1 Setup (AFDI.config.ultra)

File Configure   Help

AFDI V1.0.0.1 Setup

Remove Development Software

Environment

X Display Manager (XDM)

Network Services

Print Banners

Security Labels

Centralized Log/Audit Support Subsystem (CLASS)

Domain Name System (DNS) Resolver

Verify AFDI Software Configuration

What is AFDI? (continued)

- AFDI is <u>NOT</u> a replacement of the DII COE
  - If your using AFDI, your using the DII COE
  - AFDI is the Air Force implementation of the DII COE for DoDIIS customers
    - We are engaged and taking requirements from non-DoDIIS parties
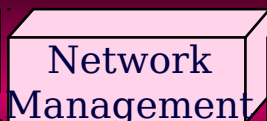   - TBMCS

What is AFDI? (continued)
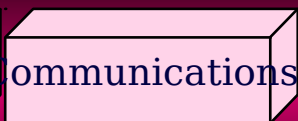
C O E

INFRASTRUCTURE SERVICES

- AFDI System Services
- Network Management
- Presentation and Web
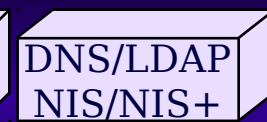- Communications

DII COE KERNEL

- AFDI Security Services
- System Management
- Windowing
- Print Services
- DNS/LDAP NIS/NIS+
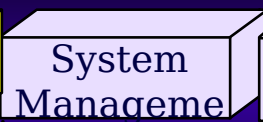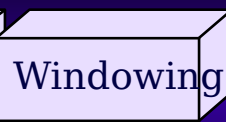
Operating System

What is AFDI? (continued)

Allows Non-Segmented DoDIIS Applications to Co-exist and interoperate with Segmented COE Applications…
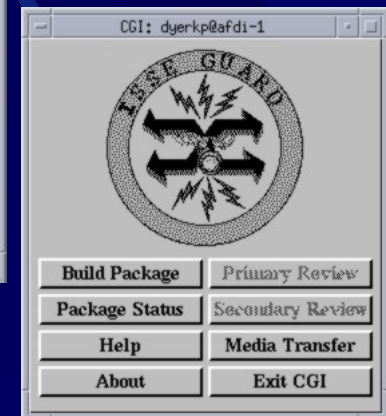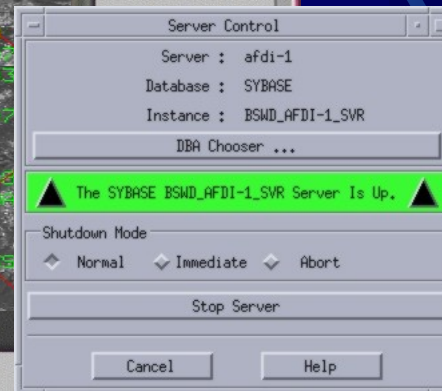
What is AFDI? (continued)

...While still allowing
Integration and use of
Tactical Operations
Segments
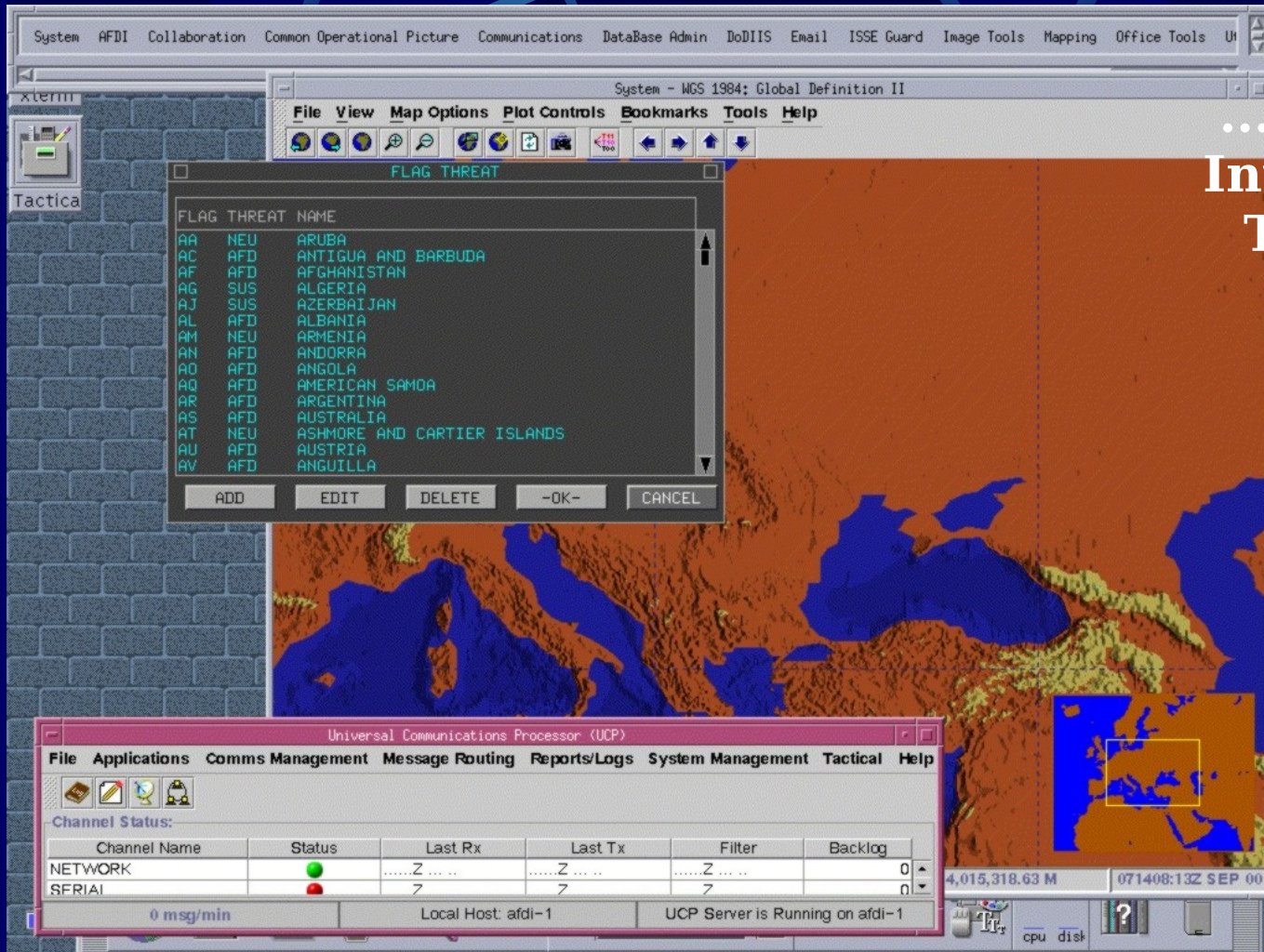
What is AFDI? (continued)
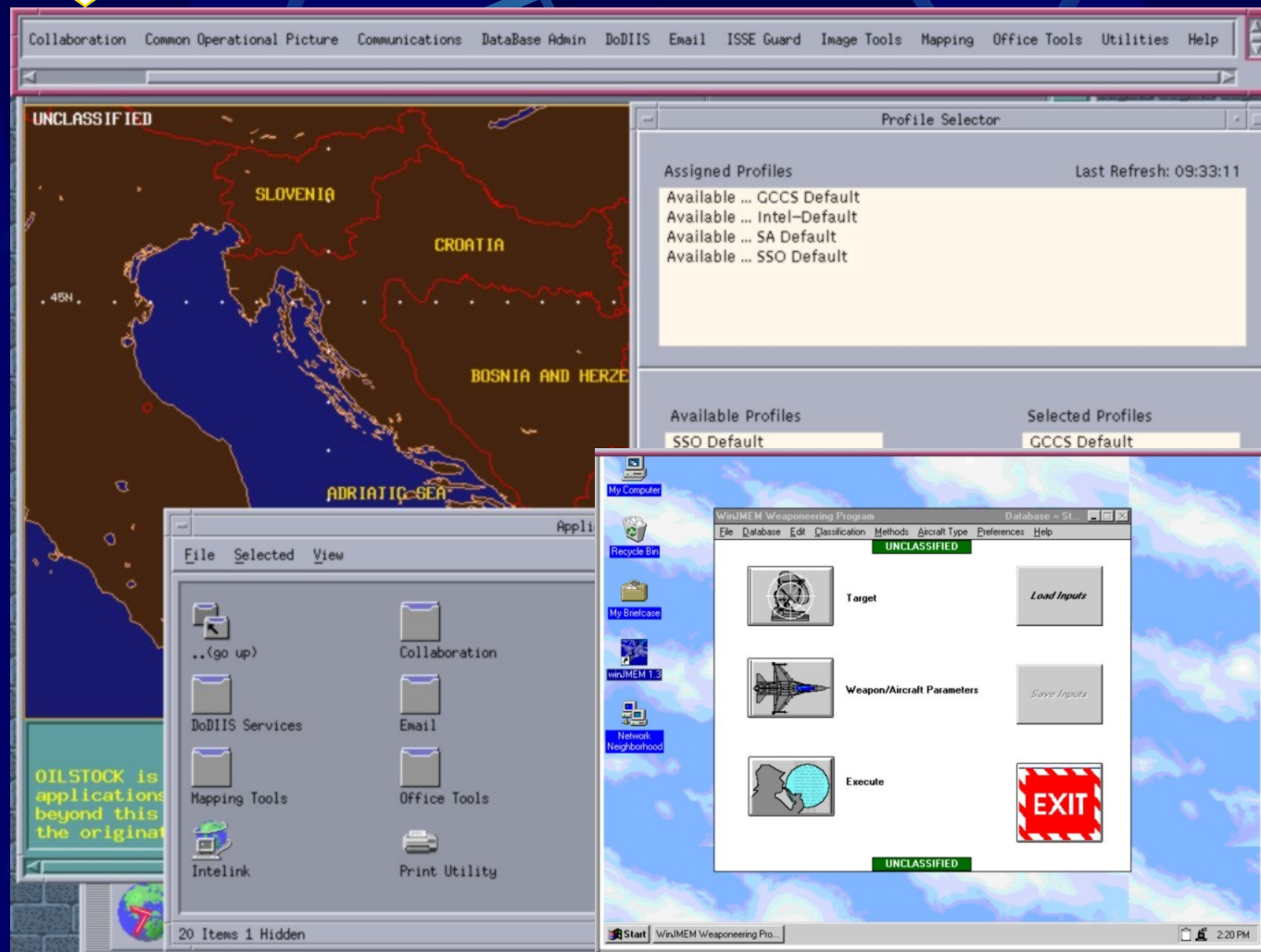
...UN-Segmented Apps run under AFDI Sessions (Interoperability mixed environme during transition

Segmented Apps Continue to run under COE Profile or as part of DoD Sessions...

What is AFDI? (continued)

...All through the use of a common set of DoDIIS tools interoperable and backward compatible with the current DIIS infrastructure (CSE-S) and the new migration infrastructure (AFDI)

AFDI Timeline

- Initially proposed as "Phoenix" prior to the DoDIIS Interop in San Antonio, 1998
  - Proposal was rejected by the DoDIIS SIMO and ERB
- Concept modified and briefed again by the 497th in June 1999 to the ERB, DISA, SPACECOM and EUCOM
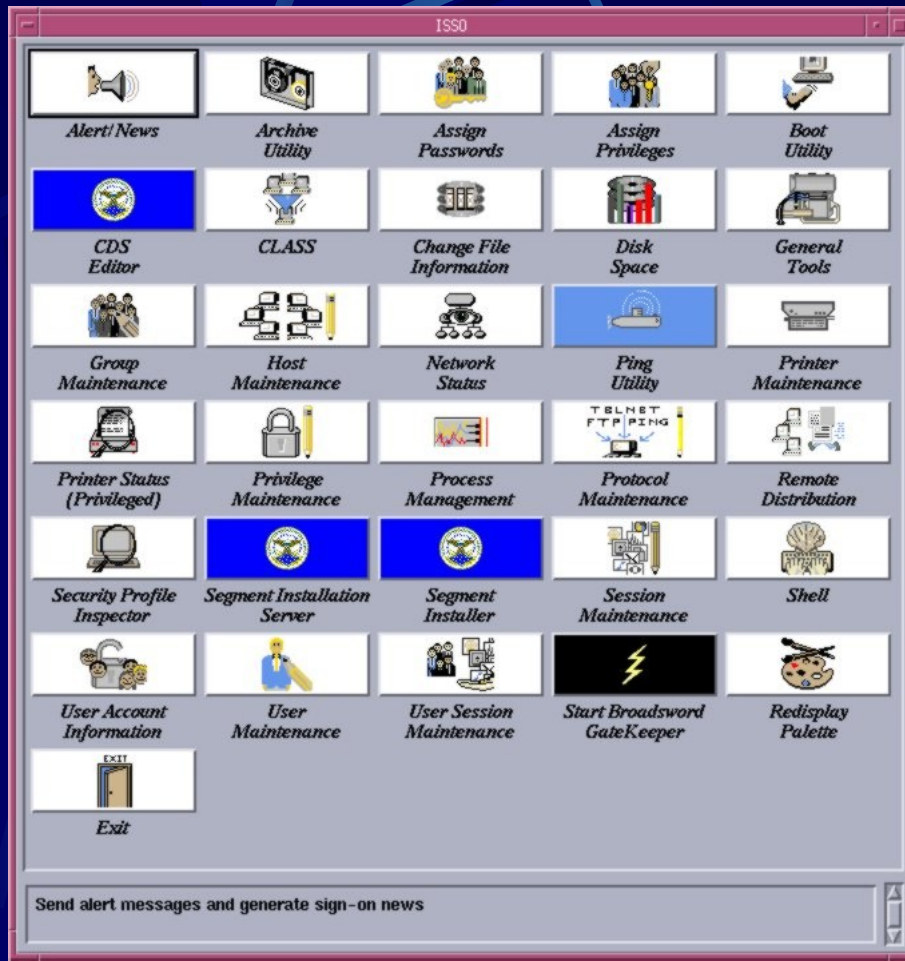 - Briefed as the DoDIIS Common Operating Infrastructure (DCOI) to the DRB in June 1999
  - Briefed, voted-on and majority approved by the DMB in July 1999
    - No funding line approved by DIA, Army, Navy
  - Air Force re-names program AFDI and funds all of it

1996   **1997**   **1998**   **1999**

AFDI Timeline (continued)

- Migration/Transition item again brought up at the 2 August 00 DMB
  - AFDI is voted on again and unanimously approved
    - Prepare for another name change

Quick AFDI Status

- AFDI V1.0 Security testing AFRL February 00
  - Participants include NSA, DIA, Air Force, Navy, Mitre/AFRL Penetration Team
    - 5 CAT 1 Security PR's fixed prior to Beta II
      - 3 CAT 1 findings by Penetration Team
- AFDI V1.0 SCI Certified at SPACECOM Beta II first week of April 00
- Installation at PACOM June 00
  - Integration with full suite of JICPAC applications
    - Many lessons learned!
- Installation at EUCOM September/October 00

1996   **1997**   **1998**   **1999**   **2000**

Quick AFDI Status (continued)

- AFDI V1.1
  - 9 - 20 October 00 JITF and Security Certification
  - Beta II 11 - 15 December 00
  - Begin Distribution January 01
- AFDI V2.0
  - CDR 19 - 21 September 00
  - Begin Distribution 15 June 01

Complete Schedule can be found at
http://extranet.if.afrl.af.mil/infrastructure/index.html

| 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |

DoDIIS DII COE Transition Solutions

- AFDI
  - Takes CSE-SS infrastructures to DII COE in a migratory fashion
- DIA COTS Pilot Program
  - No transition from current DIA mandated infrastructure
  - No centralized funding for COTS
  - Non-Segmented environment
    - Not interoperable with GCCS/GCSS

DoDIIS DII COE Transition Solutions (continued)

- Vanilla DII COE "out of the box"
  - Not SCI accredited
  - No transition from current infrastructure
  - Mandates segmented apps in a non-segmented world

DoDIIS DII COE Transition Solutions (continued)

- Bottom line

DoDIIS CSE → **How to get there?** → **DII COE**

AFDI is the only game in town

The "Bigger" AFDI Picture

What is the Bigger AFDI Picture?

- Aligns all Air Force infrastructure programs under one infrastructure umbrella
  - AFDI = secure workstations, infrastructure management
    - GateKeeper/GateKeeper Interface(s) = data access
    - ISSE Guard/TTA = controlled interface for GateKeeper data access across security domains
    - Messaging & DMS archive = solution(s) developed… jury still out… stay tuned

The "Bigger" AFDI Picture

C O E
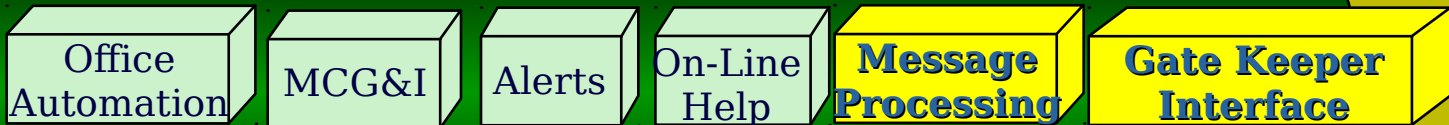
COMMON SUPPORT APPLICATIONS
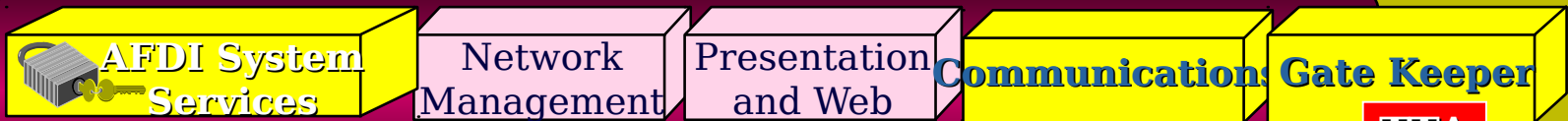
- Office Automation
- MCG&I
- Alerts
- On-Line Help
- **Message Processing**
- **Gate Keeper Interface**

INFRASTRUCTURE SERVICES

- AFDI System Services
- Network Management
- Presentation and Web
- **Communications**
- **Gate Keeper**
- **TTA**

DII COE KERNEL

- AFDI Security Services
- System Management
- Windowing
- Print Services
- DNS/LDAP NIS/NIS+

Operating System

SHADE

- MIDB
- DMS Archive
- Other DB

D A T A   A C C E S S

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The "Bigger" AFDI Picture

Dynamic Streaming Data
- **MTI**
- **TIBS**
- **TRAP**

MIDB (GMI)

5D (Imagery)

DMS Archive (Msg Traffic)

Global WAN (JWICS)

Guard

TTA

Gatekeeper

TTA

Gatekeeper

COP Applications (SIPRNET)

SCI Site LAN

Outlook Server

DMS Gateway

IPL Server

IESS Server

Intelligence Workstation
AFDI
BTG
JTT
DMS
TAS

Netscape: Broadsword Version 1.0

File Edit View Go Communicator   Help

Back Forward Reload Home Search Guide Print Security Stop

Bookmarks Location: http://kevinstoy.5M1/

Title Page Broadsword Version 1.0 Netscape Server Administration

VERSION 1.0

Welcome to: Project Broadsword

Broadsword

Registered Server

Quick Start   Username: [
User Guide   Password: [
Feedback
Support   Accept   Register
Project Broadsword
Intelink Central   This Site Has Been Accessed 22 Times
                      Since Wed Apr 21 10:06:42 1999

USE OF THIS DOD COMPUTER SYSTEM, AUTHORIZED OR UNAUTHORIZED, CONSTITUTES CONSENT
TO MONITORING OF THIS SYSTEM. UNAUTHORIZED USE MAY SUBJECT YOU TO CRIMINAL
PROSECUTION. EVIDENCE OF UNAUTHORIZED USE COLLECTED DURING MONITORING MAY BE
USED FOR ADMINISTRATIVE, CRIMINAL OR OTHER ADVERSE ACTION. USE OF THIS SYSTEM
CONSTITUTES CONSENT TO MONITORING FOR THESE PURPOSES.

AFDI Goals

Dynamic Streaming Data
- **MTI**
- **TIBS**
- **TRAP**

MIDB (GMI)

5D (Imagery)

DMS Archive (Msg Traffic)

Global WAN (JWICS)

Guard

TTA

Gatekeeper

TTA
Gatekeeper

SCI Site LAN

IESS Server

Outlook Server

DMS Gateway

IPL Server

MTIX, I3 COP (SIPRNET)

Intelligence Workstation
AFDI
BTG
JTT
DMS
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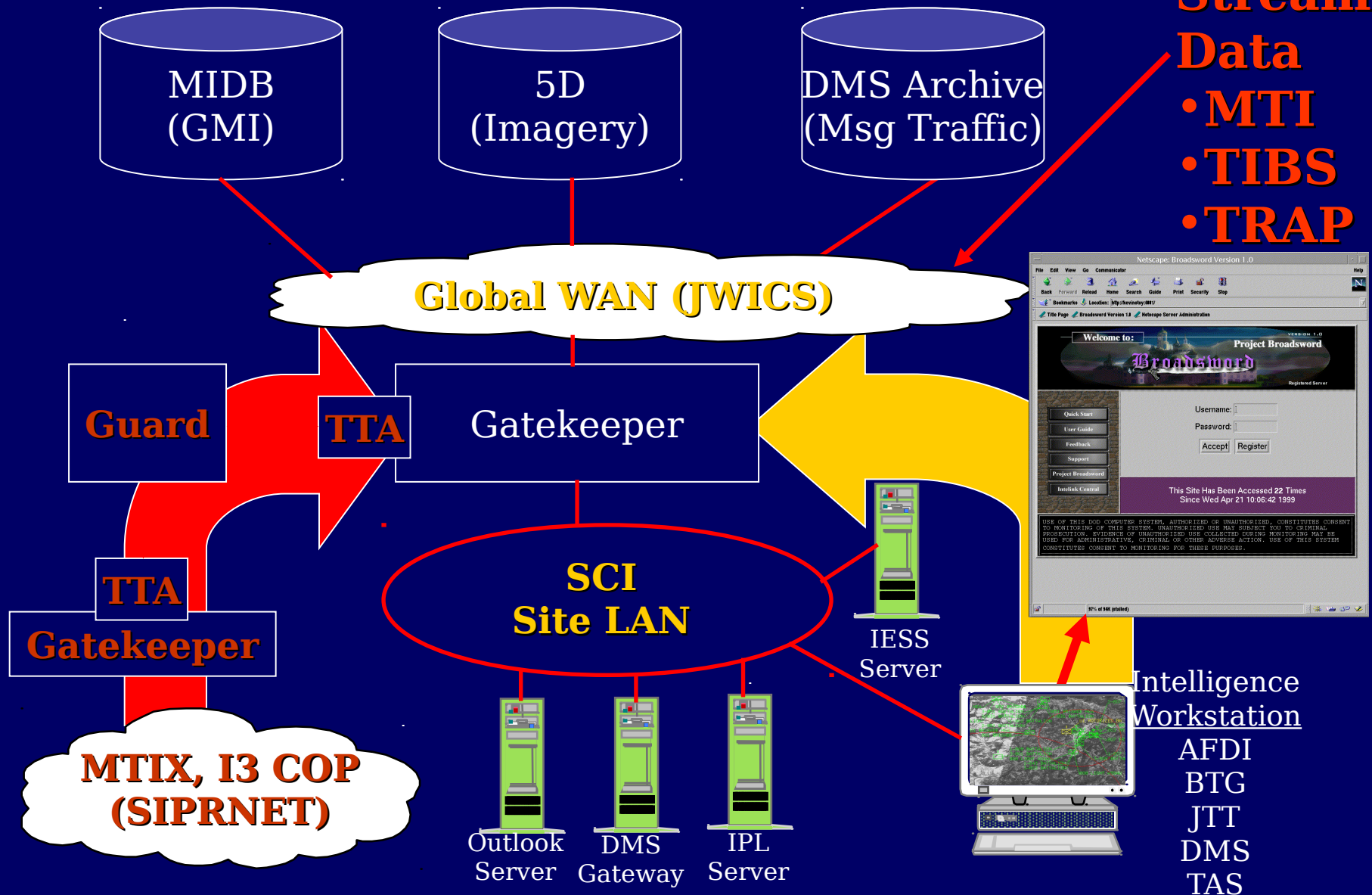
AFDI Goals (continued)
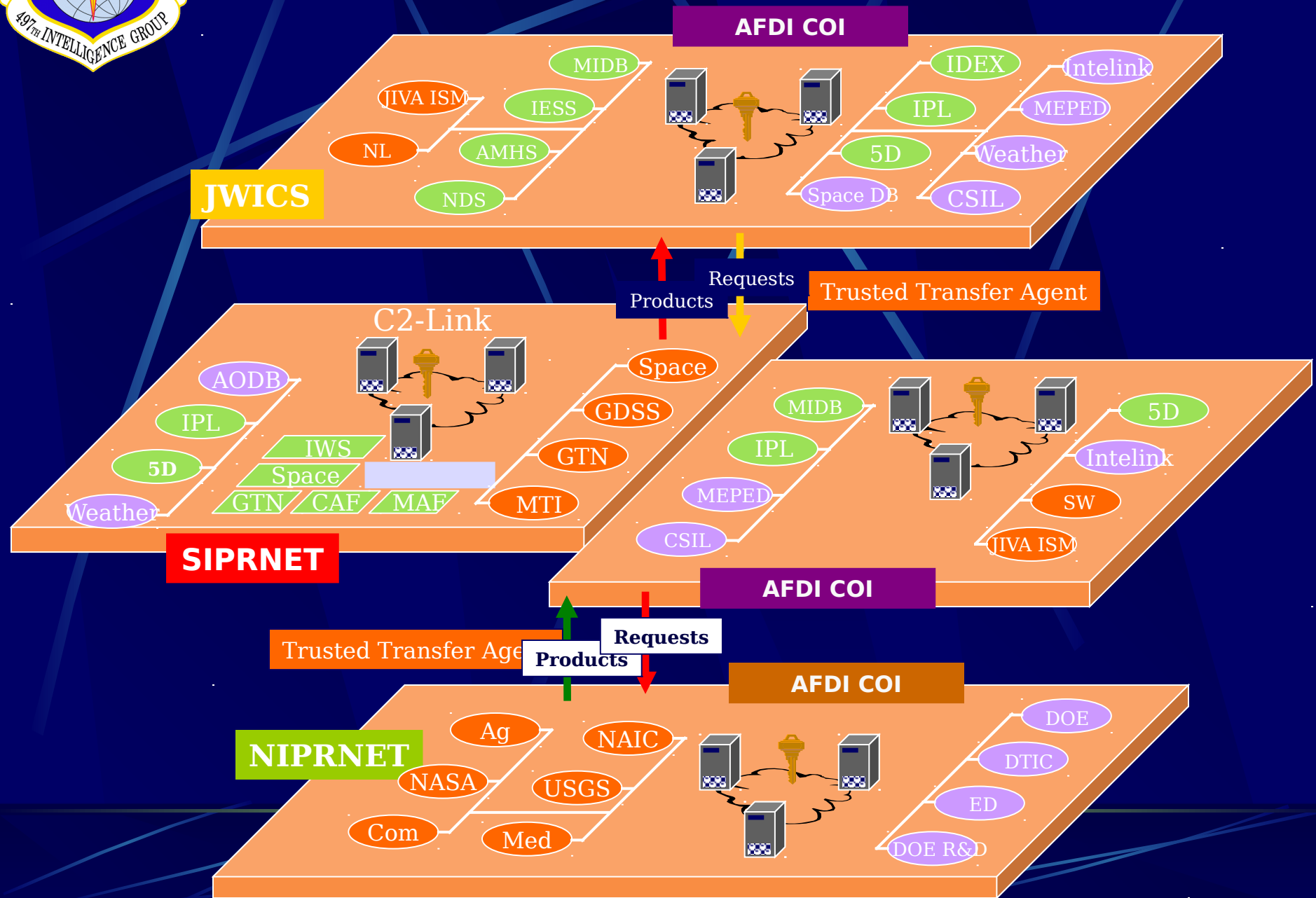
How Far Along Are We?

- AFDI accredited
- Broadsword V3.0 with TTA and ISSE Guard Security Certified for JEFX (Spiral 2)
- MTIX GateKeeper plug-in completed
- JEFX architecture accreditation July 00 (Spiral 3)
  - Includes AFDI, TBMCS, Broadsword 3.0, TTA, ISSE Guard, MTIX
- I3 database segments ordered for AFRL
  - I3 GateKeeper plug-in planned
    - The beginning of real-time/near real-time IFTW

We still have a ways to go!
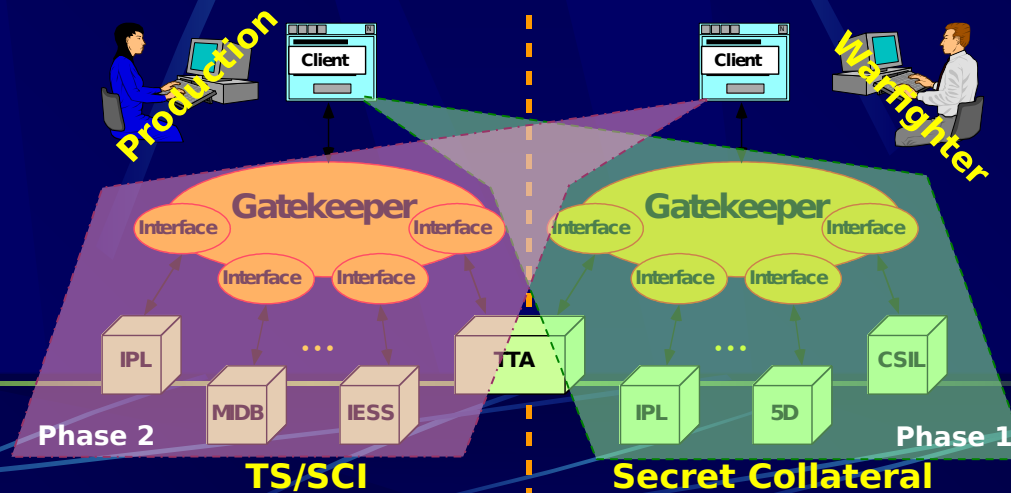
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- **Fully Integrated Infrastructu**

Big AFDI
- Full Integration

Digital
- Watermarking Metad
- Imagery, Video, Audio

ISSE User Agent (IUA)
- Java based ISSE Interfac
- MS Office product release

Message Analysis Downgrade & Dissem. (MADD)
- Sanitize, Reformat, Filter

AFDI-SS
- Secure Enterprise Mgmnt

Trusted Transfer Agent (TTA)
- MSL Information Pull
- 2 Phased Effort

Multi-Level Data Base Replication (MLDBR)
- Bi-directional Replication

Common Guard Interface
- C/C++ based ISSE

PKI

PKI

GUARD

PKI	DMS

Virus Filter

Guard Application FTP, SMTP, MIME

RELYYY

RELXXX

IET 1.0

UA 1.0

AFDI 1.0

MADD

TTA P2

Full "Big AFDI" Integratio n

| 1996-8 | 1999 | 2000 | 2001 | 2002 | 2003 |

CGI

Guard 3.1

MLDBR

TTA P1

Guard 3.2

DTG WTRMK

PKI

Multi-Low Side
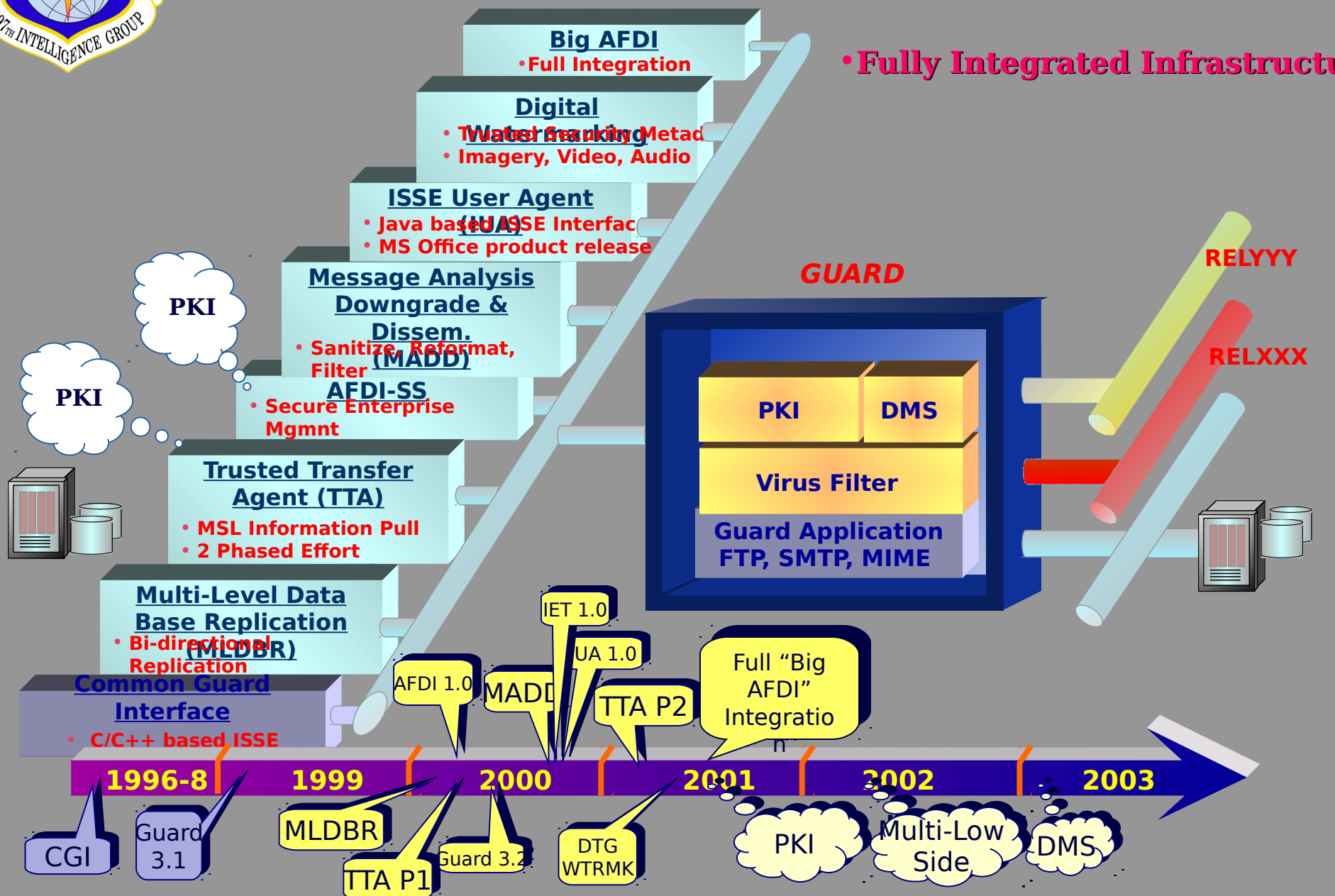
DMS

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